REMARKS

This application has been reviewed in light of the Office Action dated April 22, 2004. Claims 1, 3, 4, 7, 12-16, and 18-22 are pending in this application. Claims 21 and 22 have been added to provide Applicants with a more complete scope of protection. Claims 1, 16, and 19 have been amended to define still more clearly what Applicants regard as their invention, in terms that distinguish over the art of record. Claims 1, 16, 19, 21, and 22 are the independent claims. Favorable reconsideration is requested.

The Office Action rejected Claims 1, 3, 4, 7, 12-16, and 18-20 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,031,543 (*Miyashita et al.*).

For a general understanding of the invention, the Examiner is referred, for example, to Fig. 12 of the specification, which shows a saturation conversion characteristic (represented by the heavy, solid line). The conversion characteristic provides a mapping between the saturation information of the original image (on the x-axis) and the "converted" saturation information (on the y-axis). It is important to note that the conversion characteristic is generated based on two parameters: a low-saturation side parameter and a high-saturation side parameter.

The aspect of the present invention set forth in Claim 1 is an image processing apparatus having a saturation calculation unit that is arranged to calculate saturation information of an image. A first setting unit is arranged to set a first conversion parameter for a low-saturation side, where the first conversion parameter is set by converting a substantially minimum input value of the saturation of the image to a substantially minimum output value, and a second setting unit is arranged to set a second

conversion parameter for a high-saturation side, where the second conversion parameter is set by converting a substantially maximum input value of the saturation of the image to a substantially maximum output value. A saturation conversion characteristic generating unit is arranged to generate a saturation conversion characteristic on the basis of the first conversion parameter for the low-saturation side and the second conversion parameter for the high-saturation side. A saturation conversion unit arranged to convert the saturation of the image on the basis of the saturation conversion characteristic generated by the saturation conversion characteristic generating unit.

Among other important features of Claim 1 is that a first setting unit sets a first conversion parameter for a low-saturation side, where the first conversion parameter is set by converting a substantially minimum input value of the saturation of the image to a substantially minimum output value, and a second setting unit sets a second conversion parameter for a high-saturation side, where the second conversion parameter is set by converting a substantially maximum input value of the saturation of the image to a substantially maximum output value. By virtue of this arrangement, the image processing apparatus of Claim 1 is able to generate an adequate saturation conversion characteristic to convert the saturation of an image. That is, the saturation conversion characteristic is generated on the basis of two parameters, a first conversion parameter and a second conversion parameter, which can be dependently set. As depicted in Figure 14 of the specification, the straight line that passes from point (0, 0, 0) to point A provides support for the first setting unit, and the straight line passing from point A to point (1, 1, 0) provides support for the second setting unit. Use of a plurality of parameters in converting

the saturation of an image is advantageous, as it allows lower-saturation areas of the image to be processed differently than higher-saturation areas (see pages 1 and 2 of the specification)[1], thereby overcoming the drawback of conventional systems using only one parameter for saturation conversion, as described in detail in the specification.

Miyashita et al. relates to a technology for retouching color images, and in particular a gradation conversion of Lab data, thereby performing color information correction processing on a color image. The color information correction processing includes at least lightness, hue and saturation correction.

The Office Action cites column 6, lines 48-62, column 8, lines 3-15 and 37-55, and column 10, lines 25-44, as disclosing setting a first conversion parameter for a low-saturation side and setting second conversion parameter for a high-saturation side. Applicants respectfully disagree.

Column 6, lines 48-62, discusses that image data displayed on a screen can be corrected using various parameters for the Lab color space that are specified by the user in the color information correction processing. Column 8, lines 3-15, merely discusses the components of the image data, and that when correcting hue or saturation, a process as shown in Figure 16 is performed. Column 8, lines 37-55, discusses the color information correction process and that window 111 displays a gradation curve used in making corrections on lightness information, and window 112 displays a reference circle 106 used in making corrections on hue/saturation information. Finally, column 10, lines 25-44, discusses setting the range width of a gradation conversion curve shown in window 111 by

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1/It is to be understood, of course, that the claim scope is not limited by the details of the described embodiments, which are referred to only to facilitate explanation.

specifying parameters of input HL and SD and output HL and SD using levers 115, 116, 113, and 114 (Figure 25). As mentioned earlier, window 111 is used for making corrections on the lightness information of the image, and not on saturation.

Applicants understanding of the cited passages is that various parameters are used in the color information correction processing, but that these cited passages are silent with regard to setting a first conversion parameter for a low-saturation side, where the first conversion parameter is set by converting a substantially minimum input value of the saturation of the image to a substantially minimum output value, and setting a second conversion parameter for a high-saturation side, where the second conversion parameter is set by converting a substantially maximum input value of the saturation of the image to a substantially maximum output value, as recited in Claim 1.

In the *Miyashita et al.* method, a user can change the hue of an image by moving the position of the reference circle 106 displayed on a plane in lab color space (window 112 of Figure 25) as shown in Figure 16. This is accomplished by using levers 118 and 119. The user can also change the saturation of the image by changing the size of the reference circle 106. Figures 10, 34, and 44 of *Miyashita et al.* illustrate this process: the diameter of the reference circle 106 is decreased to lower the saturation and increased to raise the saturation using lever 120. Also shown in Figure 44, is that each conversion curve of "a" and "b" (104 and 105, respectively) are rotated counterclockwise to form new conversion lines when the reference circle 106 is enlarged by moving lever 120 to the right. Thus, saturation manipulation in *Miyashita et al.* is accomplished by controlling the diameter of the reference circle 106 (or inclination of the conversion curves of "a" data and

"b" data). However, the conversion curves, 104 and 105, correspond to only one parameter. That is, both the low-saturation side and high-saturation side are converted in the *Miyashita et al.* method using only one curve, that is specified by only a single parameter, i.e., the diameter of the reference circle 106.

Moreover, in *Miyashita et al.*, the saturation of all of the pixels is increased or decreased, regardless of whether they are low-saturation or high-saturation, i.e., the conversion characteristic is uniform across all values of saturation. *Miyashita et al.* does not even contemplate a saturation conversion characteristic that differs with respect to low-saturation and high-saturation pixels, much less a first setting unit setting a first conversion parameter for a low-saturation side, where the first conversion parameter is set by converting a substantially minimum input value of the saturation of the image to a substantially minimum output value, and a second setting unit setting a second conversion parameter for a high-saturation side, where the second conversion parameter is set by converting a substantially maximum input value of the saturation of the image to a substantially maximum output value, as recited in Claim 1. Indeed, as discussed in *Miyashita et al.*, at col. 13, lines 48-57, when the saturation control is shifted to its maximum position, there is a certain range of gradation values (values between a_{OF} and 255) that are converted to the maximum value (255). This is one of the problems the invention is meant to address (see, e.g., page 2, lines 1-9 of the specification).

Thus, nothing has been found in *Miyashita et al.* that even suggests performing a saturation conversion in which low-saturation regions can be treated differently than high-saturations regions, in the manner discussed above. *A fortiori*,

nothing found in *Miyashita et al.* would teach or suggest generating a saturation conversion characteristic on the basis of a first conversion parameter, for the low-saturation side, and a second conversion parameter, for the high-saturation side, and a first setting unit setting a first conversion parameter for a low-saturation side, where the first conversion parameter is set by converting a substantially minimum input value of the saturation of the image to a substantially minimum output value, and a second setting unit setting a second conversion parameter for a high-saturation side, where the second conversion parameter is set by converting a substantially maximum input value of the saturation of the image to a substantially maximum output value, as recited in Claim 1.

Accordingly, Applicants submit that Claim 1 is patentable over *Miyashita et al.*

Independent Claims 16 and 19 are method and computer recording medium claims, respectively, that correspond to apparatus Claim 1, and are believed to be patentable for reasons substantially similar to those discussed above in connection with Claim 1.

The aspect of the present invention set forth in Claim 21 is an image processing method for setting a conversion characteristic and converting image data by using the set conversion characteristic. The method includes setting a first conversion parameter for a low-level side of an image, where the first conversion parameter is set by converting a substantially minimum input value of the image to a substantially minimum output value. Setting a second conversion parameter for a high-level side of the image, where the second conversion parameter is set by converting a substantially maximum input

value of the image to a substantially maximum output value. Generating a conversion characteristic on the basis of the first conversion parameter, for the low-level side, and the second conversion parameter, for the high-level side, and converting the image data on the basis of the conversion characteristic generated in the conversion characteristic generating step.

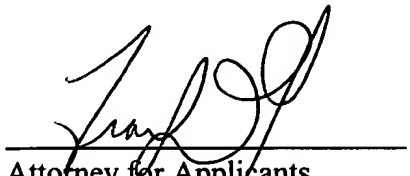
Claim 21 includes features similar to those discussed above in connection with Claim 1, with the exception of calculating saturation information of an image. Accordingly, Claim 21 is believed to be patentable for reasons substantially similar to those discussed above in connection with Claim 1. Claim 22 is a recording medium claim corresponding to method Claim 21 and is believed to be patentable for at least the same reasons as discussed above in connection with Claim 21.

The other rejected claims in this application depend from one or another of the independent claims discussed above, and, therefore, are submitted to be patentable for at least the same reasons. Since each dependent claim is also deemed to define an additional aspect of the invention, individual reconsideration of the patentability of each claim on its own merits is respectfully requested.

In view of the foregoing amendments and remarks, Applicants respectfully request favorable reconsideration and early passage to issue of the present application.

Applicants' undersigned attorney may be reached in our New York Office by telephone at (212) 218-2100. All correspondence should continue to be directed to our address listed below.

Respectfully submitted,



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